The concept and measurement of meaning in life in Dutch cancer patients

Jaarsma, Tessa A.; Pool, Grieteke; Ranchor, Adelita V.; Sanderman, Robbert

Published in:
Psycho-oncology

DOI:
10.1002/pon.1056

Psycho-Oncology
Psycho-Oncology **16**: 241–248 (2007)
Published online 18 July 2006 in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/pon.1056

The concept and measurement of meaning in life in Dutch cancer patients

Tessa A. Jaarsma[1,2]*, Grieteke Pool[1,2], Adelita V. Ranchor[1,2] and Robbert Sanderman[1,2,3]

[1] *Northern Centre for Healthcare Research, University Medical Center Groningen, University of Groningen, The Netherlands*

[2] *Department of Health Sciences, University Medical Center Groningen, University of Groningen, The Netherlands*

[3] *Department of Clinical Psychology, University of Groningen, The Netherlands*

**Correspondence to: Northern Centre for Healthcare Research, University Medical Center Groningen, P.O. Box 196, 9700 AD Groningen, The Netherlands. E-mail: t.jaarsma@med.umcg.nl*

Received: 9 June 2005
Revised: 17 March 2006
Accepted: 6 April 2006

Abstract

We investigated the psychometric properties of a Dutch translation of the Personal Meaning Profile in a heterogeneous group of cancer patients. Our study resulted in a relatively short scale consisting of 39 of the 57 original items, divided into 5 factors, labeled 'relation with God'; 'dedication to life'; 'fairness of life'; 'goal-orientedness' and 'relations with other people', which can be summed to a total score of the experience of meaning in life. The internal consistency of the total scale as well as of its sub dimensions was high. The experience of meaning in life was positively related to feelings of psychological well-being and negatively to feelings of distress. Furthermore, the experience of meaning in life was also related to trait-like characteristics as personality. Future research can investigate its appropriateness for other populations than cancer patients, and if and how the experience of meaning in life eventually changes as a result of existential threats.

Keywords: meaning in life; cancer; oncology; psychometric properties

Introduction

Cancer is a life-threatening illness that can challenge the experience of meaning in life. In this article, we will describe a measure for (changes in) meaning in life in cancer patients. The need for meaning in life is universal and is well established in a diversity of literature [e.g. 1–6]. According to Wong [7] meaning in life refers to 'an individually constructed, culturally based cognitive system that influences an individual's choice of activities and goals, and endows life with a sense of purpose, personal worth, and fulfillment'. Wong [7] argues that the experience of meaning in life may allow people to transcend intrusive, negative experiences and promote healthy, positive lives. Furthermore, interesting for the purpose of our study, the importance and value of experiencing meaning in life may *change* because of negative life experiences [e.g. 4,8–10]. Especially, severe losses may function as a trigger for a search for meaning, because they challenge the general human desire to perceive the world as ordered, predictable and meaningful [11–15].

Cancer has some specific characteristics that can challenge the experience of 'meaning in life'. The illness implies many uncertainties (e.g. about death, recurrence of the illness) and is accompanied by losses (e.g. health, job, friends, naturalness of life). Several studies report clinical levels of posttraumatic stress in patients with cancer [e.g. 16–19]. High levels of uncertainties, stress, as well as impressive losses may tackle the former, meaning-offering system that offered sense to life [8,10,20]. Therefore, it may be that part of the people confronted with the diagnosis and treatment of cancer may be forced to *change* their former life regard, as it gives no longer enough direction to life.

A review of the literature showed that many of the studies on measuring meaning in life in cancer patients are qualitative in nature [e.g. 10,21,22], or describe specifically the meaning given to the cancer experience [e.g. 23–27]. As part of a larger study concerning adaptation to, and processing of cancer diagnosis and treatment, we are interested in the measurement of meaning in life *in general* of cancer patients to be able to compare results to that of other populations. There are some general measures of meaning in life with good psychometric properties, such as the Life Regard Index [28,29] and the Satisfaction with Life Scale [30]. A recent study of White on measurement of meaning in psycho-oncology also describes several questionnaires [20]. However, to understand the concept 'meaning in life' we would like to have knowledge of the concrete *sources* from which meaning is experienced [31]. The aforementioned measures do not measure these sources.

Wong [7] developed a measure to score several concrete *sources* of experienced meaning in daily life, such as relationships, fair treatment and achievement: the *Personal Meaning Profile* (PMP). It is proposed that a greater variety of sources from which meaning is derived, will lead to a greater sense of fulfillment [31]. It is important to mention that Wong [7] makes an additional distinction in three components of meaning in life. A *cognitive* component: beliefs and interpretations of the world; a *motivational* component: strivings and personal goals; and a third component: the *affective* component, referring to *feelings* of fulfillment and satisfaction with life [see also 31,32]. Thus, meaning can be described from its sources as well as from the three components of these sources. However, because the components are most of the time interwoven in one experience and only *theoretically* discernable, while the sources are clearly distinguishable from each other, the PMP only offers the possibility to empirically measure the sources, and not the components.

We decided to make a Dutch translation of the PMP, and to investigate its psychometric properties in a sample of cancer patients. In this article, we will describe our findings concerning its factor structure (sources), reliability and relations with other concepts.

Meaning in life and positive and negative affect: external validity

The experience of meaning in life appears to have a positive relation to positive feelings of well-being, and a negative relation to distress [e.g. 29,32–34]. On the other hand, failure in experiencing meaning in life, experiencing meaninglessness, can be seen as a particular type of psychological distress [2,32]. We investigated the relation of meaning in life with two concepts of *positive* affect: *feelings of innerness* (as a dimension of spirituality) and the *experience of posttraumatic growth*. *Innerness* or *inner resources* can be described as the process for striving for, or discovering wholeness [35]. *Posttraumatic growth* can be defined as 'the experience of positive *change* that occurs as a result of the struggle with highly challenging life crises' [36]. As both concepts, innerness and posttraumatic growth, refer to the experience of positive aspects in life, we expect them to be positively related to meaning in life. However, there may be a difference between the constructs because 'meaning in life' and 'innerness' seem to refer to *having* purpose in life, while 'posttraumatic growth' refers more to a *process* of experiencing positive changes as a result of the struggle with a specific traumatic stressor.

In addition, we investigated the relation with two concepts of *negative* affect: feelings of *anxiety* and *depression*, because these negative feelings may hamper the ability of cancer patients to experience positive states such as meaning in life [7]. Therefore, we expect a negative relation.

Personality: exploration of relations

Next, to examining the relation of meaning in life with positive and negative *state* concepts, we also wanted to relate it to more *stable* characteristics of people: *personality traits*. According to Park and Folkman [6] personality is closely tied to the experience of meaning in life. Personality traits are assumed to influence someone's guiding assumptions and beliefs. Based on the distinction of personality in five factors [37], we explored the relation of 'meaning in life' to: (1) *extraversion*: High scorers can be described as being sociable, assertive, energetic, and cheerful people; (2) *agreeableness*: High scorers can be described as warm, genuine, cooperative people, oriented to and having trust in other people; (3) *conscientiousness*: High scorers can be described as orderly, goal oriented, disciplined people; (4) *openness to experience*: High scorers can be described as creative, cultured, susceptible to inner feelings and change or new experiences, and as being curious; and (5) *neuroticism*: High scorers can be described as being anxious, irritated, have feelings of guilt, shame, and are emotionally instable [38].

Age

Younger cancer patients have been found to experience more meaning in life [18]. It may be that in younger patients the cancer experience poses a greater sense of threat, because it is more interfering with their developmental stage, while older patients may already have learned most of their lessons of life.

Methods

Subjects and procedures

Our sample consisted of a heterogeneous group of 294 cancer patients of 18 years and older; the study was approved by the Medical Ethical Committee of the University Medical Center Groningen, the Netherlands. Patients were recruited from two hospitals and one center for psycho-oncological care in the northern part of the Netherlands. We assumed that a process of adjusting and eventually changing one's meaning-offering system can start only after the first shock, and therefore only included patients who had heard their diagnosis at least one year ago, and had finished primary treatment.

Instruments

Meaning in life. The original PMP was developed according to the 'implicit theories approach' [7].

DOI: 10.1002/pon

First, lay people were asked, by open-ended questions, to describe their *ideally* meaningful life. This resulted in a list of 102 items. Next, people were asked to rate to what extent the 'ideal items' were currently characteristic of their *actual* experience of meaning. These *actual* self-ratings appeared to be significantly and strongly related to the ideal statements, and thus the scale was assumed to be a good proxy for the measurement of the experienced *actual* meaningfulness of someone's life [7]. After a factor analysis 57 items, distinguished in 7 factors, remained:

(1) *Religion* (9 items: e.g. 'I believe that there is order and purpose in the universe');
(2) *Achievement* (16 items: e.g. 'I am successful in achieving my aspirations');
(3) *Relationship* (9 items: e.g. 'I contribute to the well-being of others');
(4) *Self-Transcendence* (8 items: e.g. 'I believe I can make a difference in the world');
(5) *Self-acceptance* (6 items: e.g. 'I am at peace with myself');
(6) *Intimacy* (5 items: e.g. 'I have someone to share intimate feelings with'); and
(7) *Fair Treatment* (4 items: e.g. 'Life has treated me fairly').

The answers are rated on a seven-point scale from '1' (not at all) to '7' (a great deal). The higher the total score, the higher the actual experience of 'meaning in life'; separate factor scores can also be calculated. In a study of Wong [7] the total PMP had a good test-retest reliability of $r = 0.85$.

The items of the PMP were translated in Dutch by three independent translators. After inter-agreement the final translation was composed. The translated items were translated back into English by an independent translator to check the validity of the translation that appeared to be good.

Anxiety and depression. The Hospital Anxiety and Depression Scale (HADS) consists of 7 items measuring 'anxiety' and 7 items measuring 'depression'. The scale was validated in the Netherlands by Spinhoven *et al*. [39], and appeared to be satisfactory. Items are rated on a four-point scale from '0' to '3' (ranges for the two subscales: 0–21; for the total score: 0–42). In our study 'anxiety' had an alpha of $\alpha = 0.89$ and 'depression' of $\alpha = 0.78$.

Innerness. We used the dimension 'innerness' of Howden's Spirituality Assessment Scale (SAS), which consists of 9 items. Items are rated on a six-point scale of '1' (strongly disagree) to '6' (strongly agree). A Dutch version of this scale appeared to be satisfactory [35]. In the present study the alpha of this sub factor was $\alpha = 0.82$.

Posttraumatic growth. The Posttraumatic Growth Inventory (PTGI) [36] consists of 21 items, that are all positively formulated and comprise five factors: 'relating to others'; 'new possibilities'; 'personal strength'; 'spiritual change'; and 'appreciation of life'. Answers are rated from '0' (I did not experience this change as a result of my crisis) to '5' (I experienced this change to a very great degree as a result of my crisis). In the current study we used the total PTGI-score. A Dutch validation study showed a high internal consistency of $\alpha = 0.95$ [Jaarsma TA, Pool G, Sanderman R, Ranchor AV. In press. Psychometric properties of the Dutch version of the posttraumatic growth inventory among cancer patients. *Psycho-Oncology*].

Personality. The NEO-FFI, a well-validated Dutch version [38], consists of 60 items divided into five factors: 'openness to experience', 'conscientiousness', 'extraversion', 'altruism', and 'neuroticism'. The items are measured on a five-point scale from 'strongly disagree' to 'strongly agree'. Scores range from 12 to 60 for each subscale. Alpha's in the current study were between $\alpha = 0.73$ and $\alpha = 0.86$.

Data-analytic approach. To test the goodness of the structure of the translated PMP we first performed a Simultaneous Component Analysis (SCA) [40] and thereafter a Multiple Group Method Analysis (MGM) [41]. However, both of these tests offered unsatisfying results. Therefore, we finally used an exploratory Principal Components Analysis (PCA) with orthogonal rotation using varimax. The number of factors to investigate was determined by using a scree-plot and examining its slope. To determine the number of items to be *deleted* we used the following rules: (1) items with a loading below 0.35; (2) items which loaded below 0.40, and moved to the first factor when investigating a different factor structure, and loaded there low as well. To measure the multidimensionality of the scale, we calculated the inter-factor correlations and the factor-total correlations. To measure the reliability of the resulting instrument we calculated its alpha's, and the inter-item correlations for each scale. An alpha of 0.7 or greater is generally considered to be acceptable. Mean inter-item correlations represent a good homogeneity of the scale in a range of 0.2–0.4 [42]. Relations with the other concepts described in the Introduction were calculated with Pearson's product-moment correlations. To compare means for the total score and the sub factors of the translated PMP, we transformed the scores from 0 to 100 (only applied to Figure 1).

Results

Respondents

The total response rate in this study is 61%. There was no significant difference between responders versus non-responders concerning gender. Demographic and medical characteristics of the patients are presented in Table 1.

DOI: 10.1002/pon

Table 1. Descriptive characteristics of the respondents in numbers and percentages ($N = 294$)

Age (years)			**Cancer site**	***Men* (N = 82; 27.9%)**		***Women* (N = 212; 72.1%)**	
Mean (SD)	55.56	(12.22)	Breast cancer	—		149	(70.28%)
Range	21–84		Gynecological cancer	—		33	(15.57%)
			Prostate cancer	34	(42.50%)	—	
Time since diagnosis (years)			Testicular cancer	6	(7.50%)	—	
Mean (SD)	3.90	(2.50)	Head/neck cancer	12	(15%)	4	(1.89%)
			Skin cancer	3	(3.75%)	6	(2.83%)
Marital status			Lung cancer	4	(5%)	2	(0.94%)
Partner	226	(76.9%)	Cancer of the brain	5	(6.25%)	—	
No partner	67	(22.8%)	Intestinal cancer	6	(7.50%)	4	(1.89%)
Missing	1	(0.3%)	(Non)Hodgkin	8	(10%)	7	(3.30%)
			Other	7	(8.75%)	7	(3.30%)
Children							
Yes	231	(78.6%)					
No	63	(21.4%)					
Education							
Low	114	(38.8%)					
Middle	73	(24.8%)					
High	89	(30.3%)					
Otherwise	15	(5.1%)					
Missing	3	(1%)					

Number of items, correlation with original PMP items, and factor structure

According to our pre-set rules, 18 items had to be removed for reasons of low and/ or double loadings. Thus, 39 items remained. Because of this relatively large loss of items, we performed a separate PCA on these items as well, to be sure not to remove meaningful items. However, these 18 items did not logically cluster into a different factor (for a description of the factors, see below). The correlation between the original 57 items and the new version of 39 items was $r = 0.98$. This high correlation indicated that no important items were lost in the new version. Therefore, we decided to include the remaining 39 items in the translated version of the PMP. These 39 items clustered together in five factors, which together explain 54.22% of the variance.

We have labeled the five factors as follows and related them to the original factors [7]:

(1) *Relation with God*: Consists of 7 of the 9 items of the original factor 'religion' and 1 of the 8 items of the original factor 'self-transcendence'.
(2) *Dedication to life*: Consists mainly of 8 of the 16 items of the original factor 'achievement', and 1 of the 8 items of the original factor 'self-transcendence' and 1 of the 9 items of the original factor 'relationship'.
(3) *Fairness of life*: Consists of a combination of the original factors 'self-acceptance' (4 of the 6 items) and 'fair treatment' (all of the 4 items).
(4) *Goal-orientedness*: Consists mainly of the 4 of the 16 items of the original factor 'achievement', and 1 of the 9 items of the original factor 'religion' and 1 of the 8 items of the original factor 'self-transcendence'.
(5) *Relation with other people*: Consists mainly of all of the 5 items the original factor 'intimacy' and 1 of the 9 items of the original factor 'relationship'.

From the above it becomes clear that in our structure, compared to the original one, there is a different clustering of the items. Furthermore, from the original factor 'self-transcendence' only 3 of the 8 items remained, and clustered over different factors.

Our five factors can be summed to a total score of meaning in life. In Table 2, our final five-factor solution, including its labels, is presented.

Inter-factor and factor-total correlations

The inter-factor correlations of the Dutch version varied from $r = 0.08$ (n.s.) between 'relation with God' and 'relations with other people' up to $r = 0.67$ ($p < 0.001$) between 'dedication to life' and 'goal-orientedness'. Correlations between the five sub dimensions and the total PMP-score varied from $r = 0.51$ ($p < 0.001$) to $r = 0.80$ ($p < 0.001$) (Table 3).

Reliability

The alpha's for the five subscales were high ($\alpha = 0.80$ and higher), as well as the alpha for the total scale ($\alpha = 0.91$) (Table 4). The mean inter-item correlations of the factors 'relation with God' and 'goal-orientedness' were relatively high, but an investigation at item level showed little overlap in content between the items.

DOI: 10.1002/pon

Table 2. Five-factor solution of the translated PMP (items are presented in the table in English with the original item numbers and between the brackets the original factor were the item belonged to: after PCA with Varimax Rotation)

	1	2	3	4	5
3. Peace with God (religion)	0.88				
51. Believe in afterlife (religion)	0.88				
20. Seek to do God's will (religion)	0.88				
52. Can have a personal relationship with God (religion)	0.86				
33. Seek to glorify God (religion)	0.85				
19. Sense of mission or calling (religion)	0.65				
54. Believe there is order and purpose in the universe (religion)	0.62				
31. Seek higher values (self-transcendence)	0.55				
50. Contribute to the well-being of others (relationship)		0.74			
48. I value my work (achievement)		0.72			
49. Make a significant contribution to society (self-transcendence)		0.70			
29. Committed to my work (achievement)		0.70			
24. I take initiative (achievement)		0.69			
21. I like challenge (achievement)		0.64			
47. Persistent and resourceful in attaining my goals (achievement)		0.61			
25. Able to make full use of my abilities (achievement)		0.51			
44. Strive toward personal growth (achievement)		0.46			
40. Do not give up by setbacks or obstacles (achievement)		0.43			
41. I am altruistic and helpful (relationship)		0.42			
35. Life has treated me fairly (fair treatment)			0.77		
37. I am at peace with my past (self-acceptance)			0.71		
36. I accept my limitations (self-acceptance)			0.66		
56. Received fair share of opportunities and rewards (fair treatment)			0.59		
14. There is rough justice in this world (fair treatment)			0.58		
46. I accept what cannot be changed (self-acceptance)			0.57		
55. I am treated fairly by others (fair treatment)			0.55		
16. I am at peace with myself (self-acceptance)			0.54		
9. I strive to achieve my life goals (achievement)				0.68	
8. I pursue worthwhile objectives (achievement)				0.67	
12. I believe in the value of my pursuits (achievement)				0.67	
5. Life has an ultimate purpose and meaning (religion)				0.56	
30. I have a purpose and direction in life (self-transcendence)				0.55	
13. I seek to actualize my potentials (achievement)				0.53	
38. I have a mutually satisfying relationship (intimacy)					0.83
43. I have found someone I love deeply (intimacy)					0.80
11. I have someone to share intimate feelings with (intimacy)					0.73
1. I have a good family life (intimacy)					0.65
17. I have confidants to give me emotional support (intimacy)					0.53
18. I relate well to others (relationship)					0.41

1 = Relation with God/higher order; 2 = Dedication to life (fulfillment); 3 = Fairness of life; 4 = Goal-orientedness (framework); 5 = Relations with other people.

Table 3. Inter-factor correlations and factor-total correlations of the translated PMP ($N = 264$)

	Total	1	2	3	4	5
Total	—	0.71***	0.78***	0.65***	0.80***	0.51***
1		—	0.29***	0.24***	0.45***	0.08
2			—	0.45***	0.67***	0.35***
3				—	0.41***	0.29***
4					—	0.34***
5						—

1 = Relation with God/higher order; 2 = Dedication to life; 3 = Fairness of life; 4 = Goal-orientedness; 5 = Relation with other people.*** $p < 0.001$ (2-tailed).

Relative contribution of the five factors to the total score of the Dutch PMP

As can be seen in Figure 1, in our sample of cancer patients, the transformed mean score of the total PMP-score is 60.8 (SD 12.76; range 0–100). The largest contributors to the total score were, respectively, the factors 'relations with other people' (M = 78.45; SD 18.47), 'goal-orientedness' (M = 68.78; SD 17.04) and 'dedication to life' (M = 66.22; SD 14.97).

Relations to other concepts

Innerness. As expected, a positive correlation was found between the total PMP-score and the spirituality factor 'feelings of innerness' ($r = 0.57$; $p < 0.001$) (Table 5).

Posttraumatic growth. The correlation between the PMP-total score and the PTGI is 0.45 ($p < 0.001$) (Table 5).

Feelings of anxiety and depression. As expected, the total PMP-score was not strongly, but significantly negatively related to feelings of anxiety ($r = -0.21$; $p < 0.001$) and depression ($r = -0.26$; $p < 0.001$). This negative relation was found for the

DOI: 10.1002/pon

Table 4. Means (not transformed), S.D.'s, possible ranges of scores, internal consistency and inter-item correlations per factor of the translated PMP

	Total	1	2	3	4	5
Mean (SD)	181.45 (29.86)	26.43 (13.23)	54.70 (9.88)	36.07 (7.37)	30.76 (6.13)	34.24 (6.65)
Possible range	39–273	8–56	11–77	7–49	6–42	6–42
Cronbach's α	0.91	0.92	0.87	0.82	0.86	0.80
Inter-item correlations, and their mean (M)		0.42 to 0.85; M = 0.59	0.17 to 0.69; M = 0.39	0.16 to 0.54; M = 0.37	0.32 to 0.75; M = 0.50	0.20 to 0.74; M = 0.40

1 = Relation with God/higher order; 2 = Dedication to life; 3 = Fairness of life; 4 = Goal-orientedness; 5 = Relation with other people.

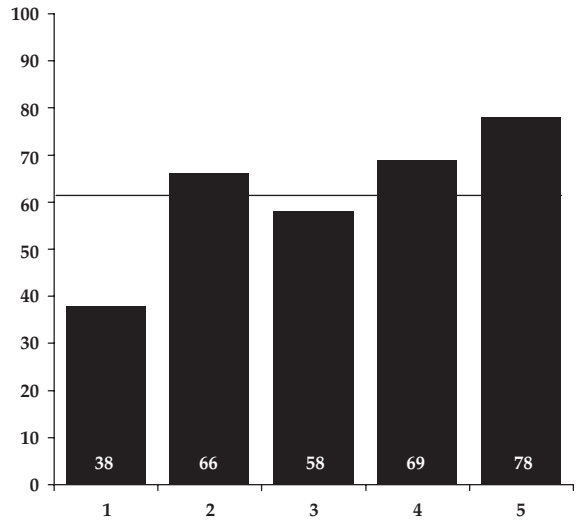

Figure 1. Transformed mean scores of the total translated PMP and its sub dimensions. 1 = Relation with God/ higher order; 2 = Dedication to life; 3 = Fairness of life; 4 = Goal-orientedness; 5 = Relation with other people. Possible range for all scores from 0 to 100. Horizontal line presents total mean score: 60.8

sub dimensions of the PMP as well, except for 'relation with God', that appeared not at all to be related to feelings of anxiety and depression. The strongest negative relation was found between 'fairness of life' and feelings of anxiety ($r = -0.41$; $p < 0.001$) and depression ($r = -0.40$; $p < 0.001$) (Table 5).

Personality. The total PMP-score appeared to be *positively* related to 'extraversion' ($r = 0.35$; $p < 0.001$); 'agreeableness' ($r = 0.22$; $p < 0.001$); 'conscientiousness' ($r = 0.30$; $p < 0.001$), and only slightly to 'openness to experience' ($r = 0.13$; $p < 0.05$). The sub dimension 'religion' of the PMP appeared not at all to be related to these personality measures (Table 5).

Age. A relatively small correlation was found between the total PMP-score and age ($r = -0.19$; $p < 0.001$). The strongest correlations concerned 'dedication to life' ($r = -0.29$; $p < 0.001$) and 'goal orientedness' ($r = -0.25$; $p < 0.001$) (Table 5).

Discussion

We studied the psychometric properties of a Dutch translation of the Personal Meaning Profile (PMP) [7], in a sample of Dutch cancer patients. Our study resulted in a relatively short scale consisting of 39 of the 57 original English items of Wong, divided into 5 factors, with good psychometric properties. The current factors of the Dutch version of the PMP are labeled: (1) 'relation with God'; (2) 'dedication to life'; (3) 'fairness of life'; (4) 'goal-orientedness'; and (5) 'relations with other people'. Adding the scores of the five factors gives a total score for the extent of meaning in life in cancer patients. To prevent confusion with the original Canadian version, our Dutch version is labeled: the Personal Meaning Profile-Dutch Version (PMP-DV).

All five factors had a satisfying reliability: Alpha's were in the range of $\alpha = 0.80$ to $\alpha = 0.92$. We had a relatively large sample size of 294 respondents and with our factor loadings it is allowed to use sample sizes of even less than 150 [40]. Thus, we can conclude that we did find five robust factors, whereby 'relations to other people' was the most important, and 'relation with God' the least important source of meaning in our Dutch sample of patients having cancer.

In our factor solution almost a third of the original items were deleted as a result of statistical criteria as well as the theoretical interpretability of the factors [42]. However, there was a very high correlation of $r = 0.98$ between the original 57 items and the remaining 39 items, which means that no important information has been lost. An advantage of a shorter questionnaire is, that it is less time-consuming for respondents to fill in.

There are several remarks to be made about the differences found between our factor structure and Wong's [7].

First, the original PMP was investigated in samples of *healthy* subjects, while our translated PMP was investigated in a sample of *cancer* patients. As cancer has life-threatening characteristics, that may provoke a search for meaning, this may eventually result in a different factor structure (read: different sources of meaning), compared to a general population. A longitudinal study is needed to investigate whether the sources of meaning in life change as a result of a cancer experience, or whether the relative importance of sub domains, or perhaps the breadth or depth of meaning in life changes.

DOI: 10.1002/pon

Table 5. Correlations between PMP-scores and other measures ($N = 238$)

	Total	1	2	3	4	5
Well-being						
Innerness (spirituality)	0.58***	0.57**	0.34**	0.42**	0.43***	0.11*
Posttraumatic growth	0.45***	0.33***	0.24***	0.26***	0.42***	0.17***
Anxiety	−0.19*	0.10	−0.23***	−0.40***	−0.11*	−0.16**
Depression	−0.25***	0.05	−0.30***	−0.39*	−0.18*	−0.19***
Personality						
Extraversion	0.35**	−0.01	0.46***	0.33***	0.32***	0.24***
Openness to experience	0.14*	0.12*	0.23***	−0.05	0.13*	−0.05
Agreeableness	0.24***	0.08	0.22**	0.25***	0.24***	0.09
Conscientiousness	0.32***	0.04	0.46***	0.25***	0.30***	0.10
Neuroticism	−0.25**	0.12*	−0.38***	−0.45**	−0.16*	−0.16*
Demographic						
Age	−0.19***	−0.01	−0.29***	−0.02	−0.25***	−0.15**

1 = Relation with God/higher order; 2 = Dedication to life; 3 = Fairness of life; 4 = Goal-orientedness; 5 = Relation with other people.
*$p \leqslant 0.05$; **$p \leqslant 0.01$; ***$p \leqslant 0.001$ (1-tailed).

Second, it is not surprising that we did find another factor solution, as in the development of the original PMP Wong reported that especially the factors 'intimacy' and 'relationship' were not very stable over different factor analyses: sometimes they clustered together, and sometimes they separated. Furthermore, the factors 'fair treatment' and 'self-acceptance' had a relatively low internal consistency of both $\alpha = 0.54$ in the original version [7].

Third, there may be cultural differences in the experience of meaning in life. The original PMP was tested in a Canadian sample [7], while our version was tested in a Dutch sample. Cultural differences may apply to the adjustment to cancer (see, e.g. [43]). Furthermore, although we strived in our translation to stay as close as possible to the original version and made use of a valid translation procedure, we cannot exclude the possibility that there are some differences in the *semantic* meaning of words or sentences.

As expected, the experience of meaning in life appeared to be positively related to feelings of psychological well-being, i.e. of 'innerness' and 'posttraumatic growth' and negatively to 'anxiety' and 'depression'. These findings imply that the experience of meaning in life is clearly related to psychological well-being. However, the experience of meaning in life also appeared to show relations to personality traits: it was moderately positively related to 'extraversion', 'agreeableness' and 'conscientiousness' and negatively to 'neuroticism'.

Future research is needed to further explore the construct validity of the PMP-DV, by investigating other populations. As the PMP-DV is not a disease-specific, but a *generic* measure for the extent of meaning in life, future research can investigate its appropriateness for other illnesses and for populations with other traumatic experiences, and compare the results to a healthy population. Finally, use of a longitudinal design is needed to offer insight in the interesting question, if and how the quality of meaning in life eventually *changes* as a result of processing existential threats, such as having cancer.

In the future, the PMP-DV can be applied in for example intervention studies aimed at (re)finding meaning in life, to investigate their effectiveness e.g. meaning-centered therapies of Breitbart and Greenstein [44,45] and dignity therapies of Chochinov *et al.* [46]. Furthermore, the scale can offer insight in the experience of possible *changes* in meaning in life because of confrontation with a life-threatening illness as cancer.

To conclude, The PMP-DV appears to be a useful measure for meaning in life in cancer patients.

Acknowledgements

This study was financially supported by the Dutch Cancer Society (grant number RUG 2000-2355). We are grateful to the patients who participated in this study, and to the departments Radiation Oncology and Oncological Gynaecology of the University Medical Center Groningen, the Netherlands, the department Oncological Surgery of the Martiniziekenhuis Groningen, the Netherlands, and 'Het Behouden Huys' Haren, the Netherlands, for their assistance in the recruitment of respondents.

References

1. Wong P, Fry P. *The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications*. Lawrence Erlbaum Associates, Inc., Publishers: Mahwah, NJ, 1998.
2. Frankl V. *Man's Search for Meaning: An Introduction to Logotherapy*. Beacon Press: Boston, MA, 1992.
3. Ryff CD, Singer B. Interpersonal flourishing: a positive health agenda for the new millennium. *Pers Soc Psychol Rev* 2000;**4**:30–44.

4. Thompson SC, Janigian AS. Life schemes: a framework for understanding the search for meaning. *J Soc Clin Psychol* 1988;**7**:260–280.
5. Baumeister RF. *Meaning of Life*. The Guilford Press: New York, 1991.
6. Park CL, Folkman S. Meaning in the context of stress and coping. *Rev Gen Psychol* 1997;**1**:115–144.
7. Wong P. Implicit theories of meaningful life and the development of the personal meaning profile. In *The Human Quest for Meaning*: *A Handbook of Psychological Research and Clinical Applications*. Wong PTP, Fry P (eds). Lawrence Erlbaum Associates, Inc., Publishers: Mahwah, NJ, 1998.
8. Coward DD. Constructing meaning from the experience of cancer. *Semin Oncol Nurs* 1997;**13**:248–251.
9. Coward DD. *Making meaning within the experience of life-threatening illness*. In *Exploring Existential Meaning*: *Optimizing Human Development Across the Life Span*, Reker GT, Chamberlain K (eds). Sage Publications: Thousand Oaks, CA, 2000.
10. Pool G. *Cancer*: *an existential test*. *Surviving testicular cancer—sexuality and other existential issues*. Academic Thesis, Northern Centre for Healthcare research: Groningen, 2003.
11. Davis CG, Wortman CB, Lehman DR, Silver RC. Searching for meaning in loss: are clinical assumptions correct? *Death Stud* 2000;**24**:497–540.
12. Janoff-Bulman R. Assumptive worlds and the stress of traumatic events: applications of the schema construct. *Soc Cognition* 1989;**7**:113–136.
13. Neimeyer RA. *Meaning Reconstruction and the Experience of Loss*. American Psychological Association: Washington, DC, 2001.
14. Park CL, Cohen LH, Murch RL. Assessment and prediction of stress-related growth. *J Pers* 1996;**64**:71–105.
15. O'Connor AP, Wicker CA, Germino BB. Understanding the cancer patient's search for meaning. *Cancer Nurs* 1990;**13**:167–175.
16. Cordova MJ, Andrykowski MA. Responses to cancer diagnosis and treatment: posttraumatic stress and posttraumatic growth. *Semin Clin Neuropsychiatry* 2003;**8**:286–296.
17. Alter CL, Pelcovitz D, Axelrod A *et al*. Identification of PTSD in cancer survivors. *Psychosomatics* 1996;**37**: 137–143.
18. Schroevers MJ, Ranchor AV, Sanderman R. The role of age at the onset of cancer in relation to survivors' long-term adjustment: a controlled comparison over an eight-year period. *Psycho-Oncology* 2004;**13**:740–752.
19. Van 't Spijker A, Trijsburg RW, Duivenvoorden HJ. Psychological sequelae of cancer diagnosis: a meta-analytical review of 58 studies after 1980. *Psychosom Med* 1997;**59**:280–293.
20. White CA. Meaning and its measurement in psychosocial oncology. *Psycho-Oncology* 2004;**13**:468–481.
21. Cole B, Pargament K. Re-creating your life: A spiritual/psychotherapeutic intervention for people diagnosed with cancer. *Psycho-Oncology* 1999;**8**:395–407.
22. Boon C, Huser FA. *Vallende Muren*; *Mensen Vertellen over Hun Kanker* [*Tumbling Walls*; *People Telling About Their Cancer*]. Kok: Kampen, 1996.
23. Ferrell BR, Smith SL, Juarez G, Melancon C. Meaning of illness and spirituality in ovarian cancer survivors. *Oncol Nurs Forum* 2003;**30**:249–257.
24. Cella DF, Tross S. Psychological adjustment to survival from Hodgkin's disease. *J Consult Clin Psychol* 1986; **54**:616–622.
25. Salmon P, Manzi F, Valori RM. Measuring the meaning of life for patients with incurable cancer: the life evaluation questionnaire (LEQ). *Eur J Cancer* 1996; **32A**:755–760.
26. Dirksen SR. Search for meaning in long-term cancer survivors. *J Adv Nurs* 1995;**21**:628–633.
27. Peterman AH, Fitchett G, Brady MJ, Hernandez L, Cella D. Measuring spiritual well-being in people with cancer: the functional assessment of chronic illness therapy—Spiritual Well-being Scale (FACIT-Sp). *Ann Behav Med* 2002;**24**:49–58.
28. Battista J, Almond R. The development of meaning in life. *Psychiatry* 1973;**36**:409–427.
29. Debats DL. The Life Regard Index—reliability and validity. *Psychol Rep* 1990;**67**:27–34.
30. Pavot W, Diener E. Review of the satisfaction with life scale. *Psychol Assess* 1993;**5**:164–172.
31. Reker GT. Theoretical perspective, dimensions, and measurement of existential meaning. In *Exploring Existential Meaning*: *Optimizing Human Development Across the Life Span*, Reker GT, Chamberlain K (eds). CA: Sage Publications: Thousand Oaks, 2000.
32. Van Ranst N, Marcoen A. Structural components of personal meaning in life and their relationship with death attitudes and coping mechanisms in late adulthood. In *Exploring Existential Meaning*: *Optimizing Human Development Across the Life Span*, Reker GT, Chamberlain K (eds). Sage Publications: Thousand Oaks, CA, 2000.
33. Scannell ED, Allen FCL, Burton J. Meaning in life and positive and negative well-being. *N Am J Psychol* 2002; **4**:93–112.
34. Zika S, Chamberlain K. On the relation between meaning in life and psychological well-being. *Brit J Psychol* 1992;**83**:133–145.
35. Garssen B, Tromp S, Van Dierendonk D. Meten van spirituele ervaringen. Aspecten van en vragenlijsten over spiritualiteit [Measuring spiritual experiences. Aspects of, and questionnaires about spirituality]. *Gedrag Gezondh* 2001;**29**:211–227.
36. Tedeschi R, Calhoun L. The posttraumatic growth inventory: measuring the positive legacy of trauma. *J Trauma Stress* 1996;**9**:455–472.
37. McCrae RR, Costa PT. Comparison of Epi and Psychoticism scales with measures of the 5-factor model of personality. *Pers Indiv Differ* 1985;**6**:587–597.
38. Hoekstra HA, Ormel J, De Fruyt F. *NEO-PI-R / NEO-FFI*. Swets & Zeitlinger B.V.: Lisse, 2003.
39. Spinhoven P, Ormel J, Sloekers PPA, Kempen GIJM, Speckens AEM, Van Hemert AEM. A validation study of the Hospital and Depression Scale (HADS) in different groups of Dutch subjects. *Psychol Med* 1997;**27**:363–370.
40. Floyd FJ,Widaman KF. Factor analysis in the development and refinement of clinical assessment instruments. *Psychol Asses* 1995;**7**:286–299.
41. Ten Berge JMFT, Kiers HAL. Simultane componentenanalyse voor twee of meer groepen personen [Simultaneous component analysis for two or more groups of people]. *Ned T Psychol* 1990;**45**:221–226.
42. Briggs SR, Cheek JM. The role of factor analysis in the development and evaluation of personality scales. *J Pers* 1986;**54**:106–148.
43. Ramirez AJ, Bogdanovic MR, Jasovicgasic M. Psychosocial adjustment to cancer—cultural considerations. *Eur J Psychiatry* 1991;**5**:9–18.
44. Breitbart W. Spirituality and meaning in supportive care: Spirituality—and meaning—centered group psychotherapy interventions in advanced cancer. *Support Care Cancer* 2002;**10**:272–280.
45. Greenstein M, Breitbart W. Cancer and the experience of meaning: a group psychotherapy program for people with cancer. *Am J Psychother* 2000;**54**:486–500.
46. Chochinov HM, Hack T, Hassard T, Kristjanson LJ, McClement S, Harlos M. Dignity therapy: a novel psychotherapeutic intervention for patients near the end of life. *J Clin Oncol* 2005;**23**:5520–5525.

DOI: 10.1002/pon